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EXAMINER	
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ART UNIT	PAPER NUMBER
1792	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/608,521	RAFAC ET AL.	
	Examiner	Art Unit	
	MARIANNE L. PADGETT	1792	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *03 June 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-12* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-12* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

1. Applicants' statement in the remarks of their 6/3/2008 response on the third paragraph of page 8, with respect to the 12/4/2007 interview, which state that the examiner entered the proposed claim amendments discussed in that interview, it is inaccurate, as no examiner's amendment was made or could be made, because the case was not being allowed. No such action of entering an informal proposal was done or was agreed to by the examiner. However, after the interview, applicants submitted a formal amendment with the RCE of 1/18/2008, which has the amendments discussed in the proposal at the interview, which was entered by the PTO with the submission of the RCE, which was perhaps what applicants meant by their statement, but not what they said.

While applicants have made an amendment to independent claim 1 related to suggestions of the examiner in section 1 of the action mailed 3/18/2008, but has also added some limitations with ambiguous associations & relative meanings.

Applicants have clarified that the cryptic terminology as found on pages 4, 5, 6, 7 & 8, which the examiner mistook for trademarks or tradenames, are not such, but merely abbreviations denoting intended use & Company of origin, thus even less meaningful than tradenames would have been, with respect to what materials are actually being treated & unfortunately means that it appears to be essentially impossible to supply such missing information, as no tradenames are involved which could have enabled applicants to provide supporting prior art evidence of what the essentially **undisclosed** coating material is, which applicants desire to treat for specific chemical, physical and optical effects. While applicants appear to be alleging systems sold by applicants & companies of "ARO" & Corning are well known in the art, this does not provide the examiner with any useful or enabling information on what materials are actually been laser treated. While applicants state that there are only a certain number of materials that may be utilized as multilayer reflective coatings, they fail to ever actually state on the record what they believe their process encompasses, but more importantly there is no statement in the specification or in any sworn to document that provides any such clarification of scope of enablement, forcing the examiner

and the reader to rely on their own guesses instead of applicants' specification, as to the materials actually being treated.

2. **Claims 1-12** remain rejected under 35 U.S.C. **112, first** paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter, which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

The 1/18/2008 amendment to the independent claim contained New Matter with respect to removal of water from dielectric materials other than those disclosed in the specification, but as previously noted what materials are disclosed therein is unknown due to their identification only via abbreviations (Company of origin & intended enduse as per applicants clarification in the 6/3/2008 response, bridging pages 8-9), thus it appears that the claim limitations directed to generic multi-layered dielectric reflectivity coatings encompasses New Matter, in that not all such dielectric reflectivity coatings are disclosed by the specification to be effectively treated as claimed, however what scope is covered cannot be determined by the examiner due to the lack of any indication of what materials are employed, other than identification by designation by enduse & some so companies that sell relevant optical equipment, or the like.

On page 10 of applicants' 6/3/08 response applicants repeat three paragraphs from their specification which the examiner on review of the specification finds are located on page 9, starting on line 3, are relevant only to "the thin dielectric films on the mirror substrates "(not all multilayer dielectric reflect to be coatings on unlimited substrates) and notes that the context of this disclosure is in reference to the preceding examples, which are limited to examples of treatment of specific coated mirrors obtained from specific companies, but not identified such that the coating materials being treated may be determined, thus as previously discussed by the examiner, the removal of water in the scope claimed

encompasses New Matter & is also unclear in what scope might even be intended to be covered, i.e. the scope of enablement of the specification, thus the claims is unclear.

3. The **amendment filed 6/3/2008** is **objected** to under **35 U.S.C. 132(a)** because it introduces new matter into the disclosure. 35 U.S.C. 132(a) states that no amendment shall introduce new matter into the disclosure of the invention. The added material which is not supported by the original disclosure is as follows: in the paragraph on page 1, starting on line 18 (includes lines 21-22, thus direction sufficiently clear) the addition of "in used for such applications as integrated circuit photolithography manufacturing processes" appears to be new matter, lacking any showing of support in the original specification (not cited by applicants, and not found in a search of applicants' PGPub of this application), or a citation of a showing common knowledge in the prior art.

Applicant is required to cancel the new matter in the reply to this Office Action.

4. **Claims 1-12** are rejected under 35 U.S.C. **112, first** paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter, which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

The claims may **still** be considered nonenabled in that no disclosure was found in the specification as to **what actual materials** may be employed for the "multi-layered dielectric reflectivity coating", thus are not enabling to one of ordinary skill in the art to determine what materials may be employed with the claimed treatment to produce the claimed effect. The examiner notes that applicants do refer to various mirrors, which were treated, such as "ARO OPuS high reflectivity mirrors", said to have a fused silica **substrate** (page 4), or "and ARO high density film on a **calcium fluoride... substrate**... part number 119679, and Corning samples with different film formations..." (page 5), but **none** of these references to enduses, companies or part numbers, etc., provides any teachings to **what materials** are actually being treated in the claimed process, nor are the undisclosed materials used in

products supplied by named companies, etc., necessarily immutable, hence any attempt to amend the specification for what coatings were employed on the named mirrors, etc., must be supported by appropriate **prior art** showings of what those exemplary tested mirrors, etc., encompassed, however as apparently no Tradenames have been supplied, this may be impossible. Basically, the specification is silent with respect to what materials are ever actually treated by the process, making it virtually impossible for the examiner to perform a full & meaningful search, as she does not know what materials are or might be being irradiated. Furthermore, to elaborate, the examiner finds no indicated usefulness of all possible dielectric materials under existence that may be employed for some reflective purposes, either for virtually any portion of the electromagnetic spectrum as now claimed, or for the specific ranges of wavelengths actually discussed in the specification, or that all such dielectric materials are affected in the same way by DUV laser irradiation as now claimed, so as to induce removal of water vapor causing compaction or densification of the dielectric. For instance, polymeric materials can be both dielectric & have reflective properties, as well as multilayers, so are applicants intending to claim about 2 billion DUV laser pulses onto such materials? Note that supplying the product data sheets or the like on the exemplary multi-layered reflective materials tested in the specification, generally provides at least the basic information on type of material of which the products described by the Tradenames or the like, are made, so as to provide enablement for inserting via amendment information concerning Tradenames, etc.

It was previously noted that what material, i.e. what dielectrics are being treated & how it was formed, is very important to whether or not there are potential problems with respect to compaction or densification during use with DUV. For example JP 4-228560 to Takashi et al. teaches a dielectric multilayer film with the appropriate resistance to be used in environments exposed to high temperatures, such as optical parts for a higher output and high repetition laser of UV rays, where the technique produces a product where the optical and physical constants, such as refractive index and density, are stabilized, and the film may be used as a reflection increasing film (abstract), with figures showing

multilayer oxides, such as alternating alumina and silica, and with col. 5-6 of the Japanese patent appearing to indicate use of wavelengths of 248 nm or from a KrF radiation source (i.e. DUV). Alternately, Ruffner (5,911,858), in its background (col. 4, lines 29-67), indicates that while some materials, such as silicon dioxide used in lenses absorb small amounts of radiation at 193 nm, such that the radiation is converted heat causing recrystallization so that the lens undergoes optical compaction, other dielectric materials, such as CaF_2 is less susceptible to absorption problems at 193 nm, but have other problems such as stress induced birefringence, thus again showing the importance of identifying materials employed for the claimed exposure technique to be meaningful with respect to densification, as well as showing that there is no support for nor reason to expect, all dielectric materials or all multi-layered dielectric materials or all multi-layered dielectric "reflectivity" coatings to be affected in a like manner by any particular wavelength of DUV or by all wavelengths of DUV.

5. **Claims 1-12** are rejected under 35 U.S.C. **112, second** paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

While applicants' independent claim 1 has been amended to correct issues & problems noted in sections 1 & 5 of the action mailed 3/18/2008, the amendment also includes addition of the relative term "high" used to further limit "high DUV optical fluence" and "high powered laser DUV light source", where the claims do not supply clear metes and bounds for these relative terms that would enable what values optical fluence or what powers of applied DUV laser light are considered to be "high", nor were clear metes and bounds found in the specification, just use of the relative term, such as found on page 1, line 19, page 8, line 15 or page 9, line 21. However, such use does not constitute a definition or provide clear scope of what values of optical fluence or power are intended to be employed/claimed by the limitation of "high".

Also, in the last line of independent claim 1, the scope of the wavelengths produced by the DUV laser source is unclear since "300 nm in wavelengths or less" would appear to be including an open-ended range of 300 nm & all wavelengths smaller than that as DUV or from the laser, or ambiguously the "DUV" designation might be intended to imply some lower limit, but which is not clear. Also, the phrasing in the "wherein the pretreatment..." limitation of the last four lines may be considered further ambiguous, in that the ", where one or more applications..." phrasing could ambiguously be considered to refer to either the "pretreatment" or the subsequent "use". Assuming the examiner's assumption that the intent of all the amendments in this section is to clarify the subsequent use of the pretreated dielectric reflectivity coating, the examiner believes that phrasing, such as --exposed the coating to DUV optical fluence occurs during use, wherein the DUV optical fluence is produced by a DUV light source of 300 nm wavelengths or less. -- Such phrasing would remove the ambiguity as to whether the amended applications are during the pretreatment or the use, plus clarify that the lower claimed end of the wavelength range are still within the DUV range. While these are subtle differences in the phrasing of the claims, from the arguments on record, it appears that the examiner that eliminating such ambiguities is important to the critical intent of applicant's process.

Claim 11 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. Claim 11 appears to be **identical**, including dependence on dependent claim 5, two the preceding new dependent claim 10, hence claim 11 does not provide a further limit.

6. The following is a quotation of the appropriate paragraphs of **35 U.S.C. 102** that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

The following is a quotation of **35 U.S.C. 103(a)** which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. **Claim 1** is rejected under 35 U.S.C. **102(b)** as anticipated by or, in the alternative, under 35 U.S.C. **103(a)** as obvious over **Ruffner** (5,911,858), for reasons as set forth in section 6 of the action mailed 10/25/2007, especially considering comments in section 1 above & the ambiguity of the added limitation as set forth in section 5 above.

Claims 2 & 4 are rejected under 35 U.S.C. **103(a)** as being unpatentable over **Ruffner**, as set forth in section 7 of the action mailed 10/25/2007.

Applicants' new claims 8-9 claim that the use of the created optical system, or ambiguously the exposing treatment of the multilayer dielectric reflectivity coating may be with an ArF excimer laser (193.38 nm), however as noted on calm 14, lines 34-49, especially 46-47 of Ruffner., such lasers are disclosed with respect to their process.

If the "wherein..." limitation was modified as suggested by the examiner in the comments of section 5 above, it would remove the ambiguity & appropriately define the scope of the "use", thus removing these rejections over Ruffner et al.

7. **Claims 1-2 & 8-9** are rejected under 35 U.S.C. **102(b)** as being anticipated by or, in the alternative, under 35 U.S.C. **103(a)** as obvious over **Pan et al.** (2002/0001672 A1), as set forth in section ninth of the action mailed 10/25/2007.

Claims 3-4 are rejected under 35 U.S.C. **103(a)** as being unpatentable over **Pan et al**, as set forth in section 9th of the action mailed 10/25/2007.

Applicants' new claims 8-9 claim that the use of the created optical system, or ambiguously the exposing treatment of the multilayer dielectric reflectivity coating may be with an ArF excimer laser (193.38 nm), however as noted in paragraph [0025] of Pan et al., such lasers are disclosed with respect to their process.

As the laser radiation applied in Pan et al. is also applied during use in optical systems such as a laser, if the "wherein..." limitation was modified as suggested by the examiner in the comments of section 5 above, it would remove the ambiguity & appropriately define the scope of the "use", thus removing these rejections over Pan et al.

8. **Claims 1, 5-8 & 10-12** are rejected under 35 U.S.C. **103(a)** as being unpatentable over **Belleville et al.** (6,180,188 or 6,387,517), previously discussed section 9 of the action mailed 10/25/2007.

Applicants' amendments to the independent claim have ambiguously specified the light source that affects the coated product when it is used subsequent to its manufacture in an optical system, or reiterated that which was already covered with respect to the pretreatment, with new claims 8-12 specifying the specific excimer laser of ArF. With respect to the probable intent of defining the exposure that occurs during use of the product, note that Belleville et al. (column 1, lines 10-40+ of (571) or column 1, lines 8-42+ of (188)) teach that the intended and use of their products are for multilayer materials used as antireflective & reflective materials, including use on dielectric mirrors, with intended uses including in high-energy lasers & integrated optical systems, etc., thus procedures performed therein would be done before enduse & while at the broad background disclosure does not particularly designate

what specific lasers or wavelengths will be employed during those enduses they do suggest the expectation that the dielectric films were created or optimized for desired wavelengths. While the examiner has no way to determine what materials applicants' invention is actually treating, thus what materials are actually being employed for use with a particular claimed wavelength ranges & lasers, thus meaningful comparison with prior art is virtually impossible, however it would've been obvious to one of ordinary skill in the art to optimize coatings as taught in Belleville et al. references, depended on the particular wavelengths that the particular use would have been expected to employ, thus given the generic teachings concerning high-energy laser use may be considered to encompass the relative parameters as claimed by applicant, as well as wavelengths, given suggestion that such materials are employed for specific wavelengths & that ArF laser is are commonly employed high-energy lasers.

Applicant's claims differ from Belleville et al. patents by requiring the use of a laser to effect the compaction &/or densification of the multilayered dielectric reflectivity coating, whereas Belleville et al. when discussing the source of UV radiation that are of claimed wavelengths, specify use of lamps, such as excimer lamps when they provide an example, however an excimer lamp & an excimer laser will produce like wavelengths of light given like gas compositions for producing the excimer effect, such that it would've been obvious to one of ordinary skill in the art, that depending on the optics employed that equivalent irradiation of substrates may be affected by either excimer lamps or excimer lasers, especially considering that for these claims there is no limit or parameters that described how laser radiation is applied, thus it would've been further obvious to one of ordinary skill to use excimer light sources of either lamp or laser variety with the expectation of analogous results, especially when adjusting parameters equivalently. To paraphrase, light of the same wavelengths may be applied via an excimer lamp, as via an excimer laser, where the intensity of the light from these sources may be the same or different depending on whether the light therefrom is focused or diffused, etc., where since the purpose of the irradiation is to densify applied antiglare layer & reflective metal (Ta) oxide & silicon oxide layers

that are intended for use for optical purposes, hence will be exposed to optical radiation during use, it would've been obvious to one of ordinary skill in the art as a matter of competent workmanship, to apply sufficient densifying radiation so that the product produced would be stable under expected to use.

Applicants also require that the densification or compaction process involves the removal of water vapor, and while Belleville et al. do not discuss the mechanism by which their UV rays (preferably at full power) cause densification & crosslinking, as the exemplary depositions of the Ta_2O_5-SiO_2 multilayer involves precursor solutions, such as $Si(OEt)_4$/EtOH solutions, with no mention of deposition under controlled atmosphere (i.e. in air may be assumed), the resultant films ((118) col. 16), which are to be UV-B or UV-C (180-280 nm) treated for densification, would have been expected to have hydrogen bonded moisture present therein from exposure to the air & as well as the films being inclusive of at least some -OH ligands formed in the polymeric oxide, thus the taught UV densification/crosslinking techniques would have been expected to be inherently inclusive of the removal from the films of these impurities which would have been expected to be present due to the taught deposition techniques. Note that it is old and well-known to those of ordinary skill in the chemical arts that the presence of -OH in oxide materials such as silicon dioxide tends to produce hygroscopic affects in those oxides, which are removed by removal of the hydrogen impurities, thus reduction in hydrophilicity of the film, such as via condensation reactions that expel water vapor. Note that removal of any water from any source in the UV treatment process, such as described by Belleville et al., would affect the claimed densification, and thus read on applicants' claims as written, especially considering that from applicants' specification as written, it is impossible to determine the source of the water being removed from their essentially generic dielectric films.

To reiterate, Belleville et al. (188) teach preparing optical material by the depositing on a substrate (organic such as plastic, or inorganic such as glass) at least two layers of inorganic polymeric material, such as alternating high & low index of refraction layers containing metal oxide such as Ta_2O_5,

and silicon oxide or manganese oxide, where the optical material may be used for reflective material in dielectric mirrors for reflecting wavelengths, such as between near ultraviolet to near infrared. While the layers may be individually densified/crosslinked with DUV radiation of wavelengths from 180-280 nm from a UV lamp (excimer lamp), it is also taught to densify the assembly of layers via UV exposure of those wavelengths, where the UV dose received by the layers must be sufficient to induce crosslinking, with exposure generally conducted at energies of 5-10 J/cm^2 for times of 10 seconds-10 minutes, with power in the region of 350 mWatts/cm^2. The UV densification process is noted to affect the refractive index of the layers by increasing it, and to provide various advantages such as reduction in production time for multilayered coatings, suitability for temperature sensitive substrates, and affecting the wettability of the surface after exposure to UV for densification. In Belleville et al. (188), particularly see the abstract; col. 1, lines 7- 47, noting use of such materials for dielectric mirrors used with high energy lasers; col. 7-8, especially col. 7, lines 5-13 & 38-col. 8, line 20; col. 9, lines 19-47+ particularly directed to reflective material for mono or polychromic dielectric mirrors; col. 10, especially lines 3-6 & 24-35+ for metal or metalloid oxides to be crosslinked/densified by UV; col. 12, lines 26-28 & col. 13, lines 31-45 for effective UV exposure on refractive index of silica or tantalum oxide, etc.; col. 14, lines 31-52 for procedural outline, col. 14, lines 57-61 for depositing layers, then subsequently exposing all deposited layers to the UV for crosslinking/densification & col. 14, lines 62-col. 15, lines 42 for UV exposure parameters; col. 16, especially lines 32-62 for another procedural outline; col. 17, lines 10-36 for advantages of using UV & lines 37 plus, especially 55 to 62 for use in preparing wide spectrum than reflective material; example 14 preparation of a bi-layer optic material of high index layer of tantalum oxide & a low index layer of silicon dioxide, where final crosslinking/densification of all layers by exposure to taught UV is employed; and claims, especially 1-2, 4-5, 8 & 13-31.

Belleville et al. (517) has teachings substantially similar to those of (188), however as can be seen in example 4, bridging col. 25-26, additional teachings concerning the effect of UV radiation on the

refractive index & the thickness of the layer are presented, particularly stating that "the change in the refractive index n and the thickness of the layer e are both functions of the number of passes under UV" (col. 25, lines 63-65). Examples 5 & 6 on col. 26-27 are also directed to UV exposure techniques. Note while the deposition & UV densification procedure described on col. 20, lines 35-col. 21, line 31 may optionally perform UV densification/crosslinking with additional & intermediate deposited layer (col. 20, lines 63-col. 21, lines 13), the final densification/crosslinking via UV exposure after deposition of the final layer is not described as optional (col. 21, lines 25-31).

While both Belleville et al. references teach UV densification of materials that read on those claimed, they do not explicitly teach that further exposure to some wavelength of DUV or shorter radiation will not cause some densification, however whether or not the taught this densification is sufficient to cause maximum densification (i.e. where none more will occur), the densification that is performed inherently inhibits further densification to some degree if/when subsequent exposure to taught or claimed wavelengths occur (although subsequent exposure to optical fluence is **not** required to be DUV), due to the elimination of compositional or microstructural features that are less dense or porous during the taught UV treatment. Alternately, it would've been obvious to one of ordinary skill in the art to optimize the taught exposures, so that the cross-linking reaction & densification process goes to completion, such that the optical characteristics of the produced optical product will not alter during use, especially considering the teachings within the references that the UV densification process affects the refractive index of the materials employed, and considering that in order to form this multilayered coating for affecting reflectivity characteristics, one is employing multiple layers of different refractive indexes, such that it is clearly recognized that the refractive index employed is important & controlled by the taught densification procedure, so that one of ordinary competence in the art would have been expected to perform the taught process in order to achieve full densification of the product such the that its qualities & properties would not be affected by later use. In Belleville et al. (571) this concept is further obvious due

to the explicit teaching of both the refractive index and thickness of the layer being functions of the number of passes under UV, which can be considered equivalent to doses of UV.

As noted above, both Belleville et al. teach that the UV exposure of these coatings that affect reflectivity, also affects the wetting ability of the exposed surfaces, a property which is related to hydroscopicity, and as discussed above the amount of UV exposure would have been expected by one of ordinary skill in the art to affect the degree of cure/densification, thus it would've been obvious to one of ordinary skill in the art who desires certain properties in the resultant optical multilayer product, to determine the dosages required to optimally produce the desired product, which since it may relate to wetting ability and densification, it would have been obvious to analogously determine dosage for hydroscopicity & compaction, which are related properties.

Applicant have previously latched without providing any support that the essentially unidentified "highly reflective or antireflective multi-layered dielectric coatings that are of materials 'selected to make the highly reflective mirror reflected within a certain relatively narrow band of wavelengths of light'. Applicants submit that those of ordinary skill in the art, without undue experimentation can determine what such material is" (page 5 of 1/18/2008 response). The examiner cannot determine from applicants' specification what scope of materials, in fact cannot even determine any specific materials, applicants are intending to treat. Bridging pages 5-6 of the 1/18/2008 response, applicants further asserted "There are lists of reflectivity and anti-reflectivity coatings and specifically ones that are affected in the UV wavelengths, e.g. at around with 93 nm...", however they point out no such lists in their specification, nor do they provide any such prior art lists to provide such information, hence the record remains lacking in any clear scope associated with the materials intended to be treated by applicants' claimed process. On page 6 of the 1/18/2008 response applicants further state "the invention is not in the coating material, but rather, having selected a coating material that is subject to the recited compaction/densification, treating the coating material in the fashion claimed in order to decrease

the impact of DUV exposure when the optical element having the coating on it is further exposed to DUV light when in use in a laser system". However, the claims do not require that the multilayer dielectric reflectivity coating that has been exposed necessarily be subject to compaction/densification problems, nor to necessarily be a coating intended to be use with DUV, but instead require **any** multi-layered dielectric reflectivity coating that is treated as claimed with DUV laser radiation to be affected by inducing "sufficient compaction or densification by removal of water vapor... to inhibit subsequent compaction or densification during continued exposure to DUV or shorter wavelength radiation". The specification does not provide evidence, that all multi-layered dielectric reflective coating materials, whether used to reflect DUV wavelengths or more broadly used, will be equivalently affected. The examiner notes that applicant's state that it is a simple experiment to determine whether reflectivity and anti-reflectivity coatings are subject to compaction/densification, however as noted for the claims as written they need not actually be subject to such & applicants have provided no evidence in their arguments or specification that **all** such coatings that are subject to densification &/or compaction will have the problem cured by removal of water vapor.

With respect to the Belleville et al. references ((188) & (517)), applicants indicate that the references are "entirely unrelated to applicants claimed invention. The cross-linking method of the ' 188 reference uses ultraviolet light to promote bonding formation between polymeric materials..." (paragraph bridging pages 8-9 of 1/18/08 response), however applicants claims are so broad that such a mechanism cannot be excluded, in fact applicant specification is so broad & so **nonspecific** as to what is being treated as a "dielectric", that the claims & the specification (unless it can be further defined via providing showings with respect to the probable tradenames) must be considered by the examiner to encompass any densification process, including cross-linking processes, that would release water vapor. In other words, in light of applicant specification as presently presented, the examiner can determine no evidence that the process contemplated by applicants is any different than the mechanism of process in the Belleville et al.

references, as appears to be intended to be asserted by applicants. Applicant's discussion have provided no arguments that would show that the cross-linking reactions of the Belleville et al. references that caused densification would not be releasing water as a byproduct, thus have not countered arguments previously presented by the examiner & repeated above. In fact applicants' preceding arguments in their remarks concerning their belief that they have support for their broad claims as written (while not agreed with by the examiner), would appear to indicate they believe any densification of any dielectric material at DUV wavelengths relates to applicants' claims/specification.

9. **Applicant's arguments** filed **6/3/2008** & discussed above have been fully considered but they are not persuasive.

10. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

11. **Any inquiry** concerning this communication or earlier communications from the examiner should be directed to Marianne L. Padgett whose telephone number is (571) 272-1425. The examiner can normally be reached on M-F from about 9:00 a.m. to 5:00 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy Meeks, can be reached at (571) 272-1423. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Marianne L. Padgett/
Primary Examiner, Art Unit 1792

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9/12&15/2008